ABSTRACT

An optical transistor is disclosed that provides a fast switching time, an amplified gain, and isolation. The optical transistor receives a small optical input signal at an optical base port, generates an amplified replica at an optical emitter port, and generates an inverted replica on a vertical light at an collector port. One embodiment of the optical transistor is implemented with a vertical lasing semiconductor optical amplifiers (VLSOA), wherein the ballast light is used a signal for the collector port.